# THE STRAUSS BASCULE BRIDGE COMPANY

Specialists on Movable Bridges

Bulletin No. 3—Bascule Bridges

THE GENERAL PRINTING CO
CHICAGO

9671
TC

THIS BULLETIN has been compiled as an advance leaflet pending the issue of our new catalogue which is at present in course of preparation. It will serve to illustrate a few of our more noteworthy designs and it also contains a full list of our bascule bridges completed and under construction up to date.

We call attention to the fact that this list includes the largest, heaviest and most important bascule bridges in the world and that we count among our patrons the most conservative railway companies in this country and Canada, and some of the most prominent municipalities here and abroad. It is also interesting to note that in the short space of five years the total number of our bridges has grown to equal 25 per cent of the total number of bascules built in this country.

Our Heel Trunnion design, illustrated in the Cape Cod Canal Bridge at Buzzards Bay on the line of the New York, New Haven & Hartford R. R., is our latest type and has readily obtained recognition as the most economical and efficient design of bascule so far developed. Twelve bridges of this type are now in service or under construction, all of them large and important structures, the largest being the 186 foot single-leaf, double track and double deck bridge for the Canadian Pacific R. R. over the Kaministiquia River at Fort William, Ontario, the only one of its kind in the world. The maximum economical span for this type is in the neighborhood of 250 feet.

Another design which has a considerable future is our double-leaf, simple-span bridge, which eliminates the objections to the usual form of cantilever design for double leaf bridges. In this design the two leaves, when closed, form an ordinary simple span and are as rigid and definite in action as if they were a simple span. The maximum economical span of this design is about 400 feet.

A particularly notable structure is that of the Palace bridge at St. Petersburg, Russia, the general design of which is shown herein. This bridge crosses the Neva River directly in front of the famous Winter Palace; it has been under consideration for several years, but now that the decision as to the type has been reached, work will proceed actively so that the bridge will be completed within a couple of years. This is without question the most magnificent bascule bridge in the world and is also the largest of its kind ever built, having a clear opening of 210 feet and a width of 90 feet, thus ranking above the Tower Bridge in London, which, up too date, has been the largest and heaviest highway bascule bridge in the world. The light, graceful outlines of the Palace bridge effectually conceal its great dimensions and strikingly illustrate the possibility of combining utility and beauty within reasonable limits of cost, and it is in these features that the Strauss Trunion Bascule presents an advantage over all other types.

The above few notes merely give an outline of the scope of our work. We shall be pleased to furnish further information to all who are interested. We are also prepared to make estimates and preliminary sketches on request and are in position to promptly execute all orders received.

THE STRAUSS BASCULE BRIDGE COMPANY.

September, 1910.

*Main Office—901-4 Fort Dearborn Building*
*Chicago, Ill., U. S. A.*

*Cable Address—"Bascule" Chicago*
*A. B. C. Code, 5th Edition*

*Canadian Office—Room 14, Windsor Hotel, Montreal, Quebec*
*John Irving*
*C. H. Sutherland* } *Agents*

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# Some Points on the Strauss Trunnion Bascule Bridge

1.—It is essentially the old, reliable and time tried trunnion bridge with the most modern counterweighing device.

2.—It is an engineer's structure, designed from the engineer's standpoint and presented on the engineer's basis of worth and honesty.

3.—As a bridge it possesses every element sanctioned by the best modern practice in bridge construction. As a machine its efficiency is the same as if it were not a bridge. Nothing is sacrificed on either side. This is true of none other.

4.—It is the only bascule which secures *directly* and *positively* the main elements of bascule economy, viz., constant elevation of the center of gravity, minimum length of river arm (i. e., shortest leaf length) and maximum length of counterweight arm, or least counterweight.

5.—It is, therefore, the only bascule which is not compelled to resort to rolling contact devices, such as tracks, treads, rollers and combinations thereof, which have shown themselves wholly unequal to the task imposed upon them by the enormous forces dealt with in bridge work.

6.—Its turning devices are centered in small, compact units, completely housed and protected, thoroughly lubricated and readily accessible and renewable, creating not only the best combination for perfect operation, but also insuring freedom from derangement from all extraneous influences.

7.—It is thus distinguished by a complete absence of vital parts exposed to rust, long unprotected tracks subject to lodgment of dirt or more destructive debris, deep and dangerous pits, uncertain stops and locks, etc., which are found in other types.

8.—It is a thoroughly homogenous structure. Every element is completely determinate and absolutely definite and positive in action. Each part is relatively as strong and long-lived as any other. All members are stiff members and non-adjustable, and taken together produce a rigid and stable unit.

9.—It is, therefore, the only lift bridge in which all forces are known and provided for, in which every element can be easily and accurately computed, in which nothing is left to chance, in which overstressed material, yielding main members, flexible connections, curved girders and similar parts involving the factor of ignorance, are eliminated.

10.—It does not lift away from its supports as it opens, as is the case in some types, and thus presents the smallest possible surface to the wind and requires the minimum amount of machinery to drive it.

11.—It was the first lift bridge in which concrete counterweight was used, and is still the only one which can secure from such counterweight a perfect balancing of the leaf. This means least power consumption and wear.

12.—It requires fewer, smaller and cheaper piers than any other bascule, because the dead load reactions are vertical and constant, which eliminates from the piers the shifting of the dead weight upon them, and because the leaf reaction is separated from the counterweight reaction (heel trunnion type). No other design can approximate the small single pier

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of the Strauss Bascule, or the uniform distribution of the loads over the foundations in the double pier designs, or the economy and stability of either the single or double pier constructions.

13.—It is positively connected to the piers and is therefore unitary with them. Because of this and its low center of gravity, both open and closed, it is exceptionally stable and safe under all extremes of operation. It is also the most effectively braced of all lift bridges.

14.—It requires the least space transversely of any lift bridge, one of the most important characteristics of the bascule type, particularly in railway service. This permits a closer spacing for adjoining spans than heretofore possible and avoids the property damages from the spreading base properly demanded by bridges with high towers.

15.—Being the most perfectly balanced bascule, it is the *safest* to operate and the easiest and quickest to open and close. For the same reason, it does not slam on the piers and cannot tip over backwards. It is the only type which will respond properly and instantly whether operated once a year or a hundred times per day.

16.—It costs less to maintain under the heaviest service than any other type, as proven by the records. Difference in maintenance is the measure of value, or as it is more commonly expressed, only the best is the cheapest.

17.—But it is also the cheapest to build, that is, on the same basis of exact equality throughout. Horizontally compared, without favors and without prejudice, its total first cost is less than that of any other lift bridge. It is the only design which has made good on claims of economy. These facts are disputable by none, and should be remembered when low estimates are presented or extravagant savings are claimed.

18.—The Strauss Bascule does more than any other, does it better and does it cheaper. For the shop, it simplifies fabrication because of its straight line ordinary sized members, and because it requires no special tools; nor does it interfere with other work. For the engineer, it reduces supervision and lessens care and responsibility. For the owner, it lowers first cost and cost of maintenance.

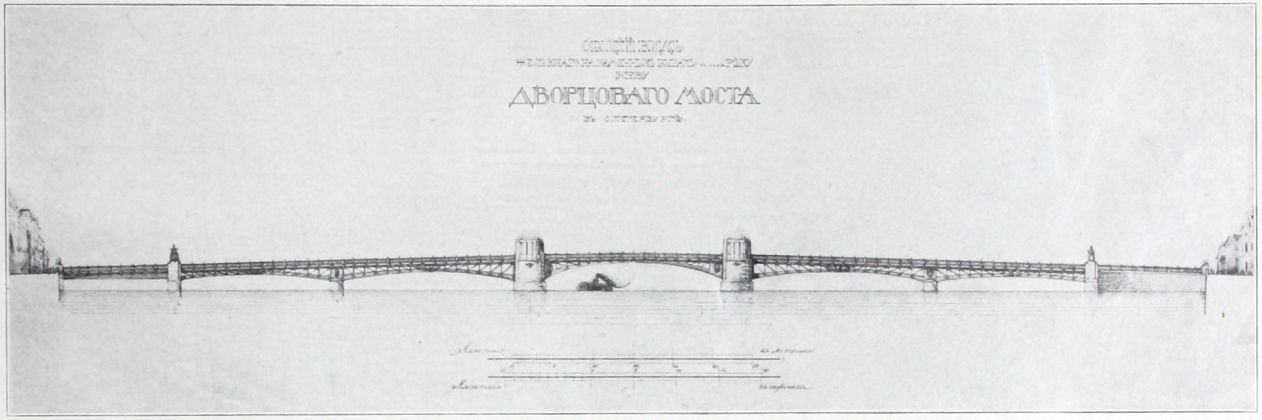
19.—In five years it has become the recognized standard of excellence and today is specified by the best engineers of the United States, Canada and Europe; engineers who have heretofore used other types exclusively, and engineers who have hitherto declined to use the bascule at all. First orders are followed by second and third, and the best friends of the design are those who know most about lift bridges.

20.—It is more generally adaptable to any and all conditions than any other type of movable bridge. As single leaf, double leaf cantilever, double leaf simple span, through truss or deck girder, single or double deck, with overhead or underneath counterweight, highly ornamental or severely plain, small or large, it meets the varying requirements of every crossing. The only double deck bascule in the world, and the only double leaf simple span bascule are Strauss bascules, and the greatest structures of this kind ever built are Strauss bascules.

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Double Leaf—Movable Span, 240 ft.; width, 90 ft.
Ornamental—Underneath Counterweight
Highway and Double Track Electric Railway

***PALACE BRIDGE***
*including*
***STRAUSS TRUNNION BASCULE BRIDGE***
*Across the Neva River in front of the*
*Czar's famous Winter Palace*
*For the City of St. Petersburg*

Design adopted in International competition
To be the largest highway Bascule in the world

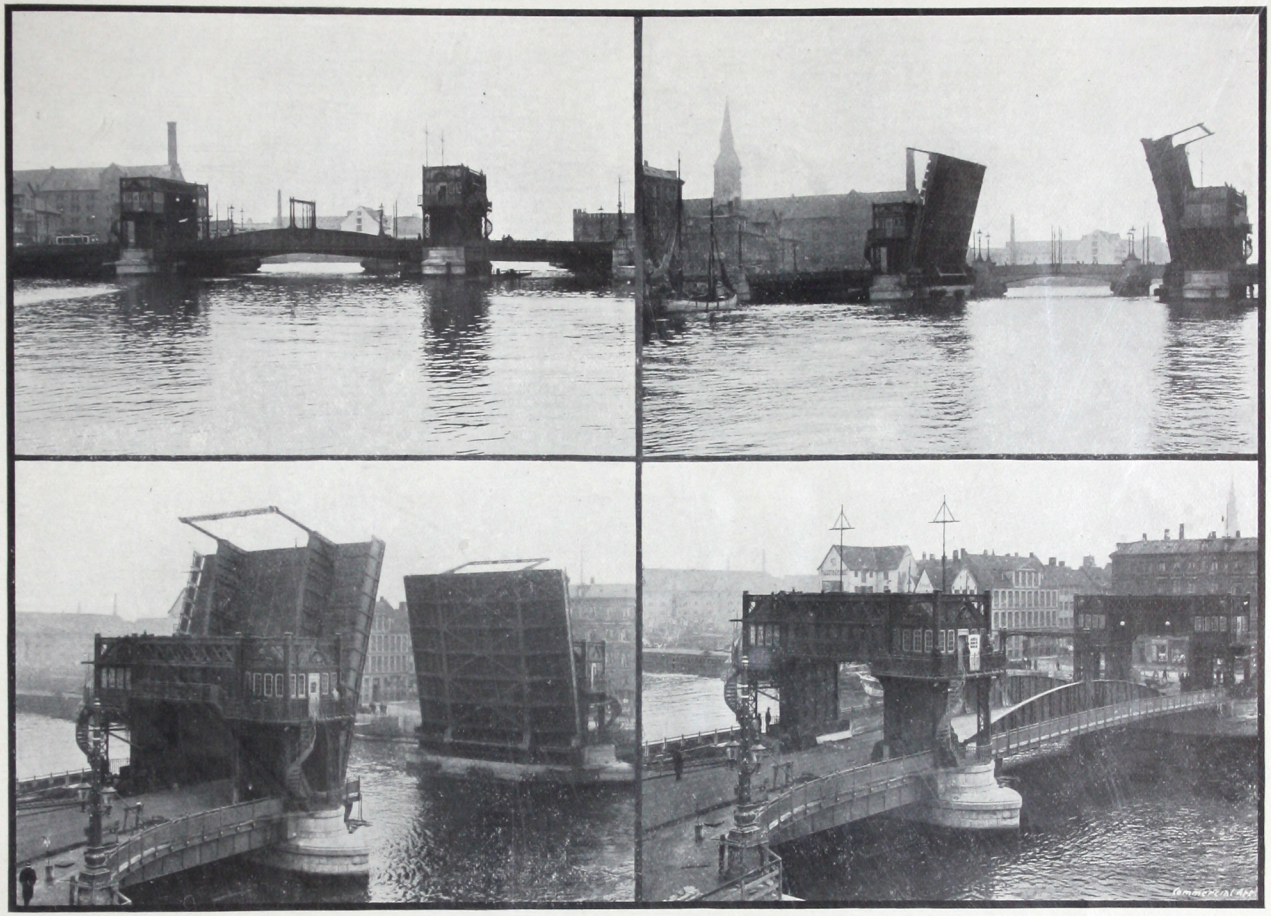
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THE STRAUSS BASCULE BRIDGE CO.
CHICAGO

THE KOLOMNA WORKS ST. PETERSBURG
Contractors

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Double Leaf—Movable Span, 109 ft. 2 in.
Ornamental—Overhead Counterweight
Highway and Double Track Electric Railway

***STRAUSS TRUNNION BASCULE BRIDGE***

***(Knippel's Bridge)***

***For the Harbor and City of Copenhagen, Denmark***

Second largest Bascule in Europe
Opens and closes in 50 seconds

HARBOR ADMINISTRATION:
H. C. V. MÖLLER, Chief Engineer

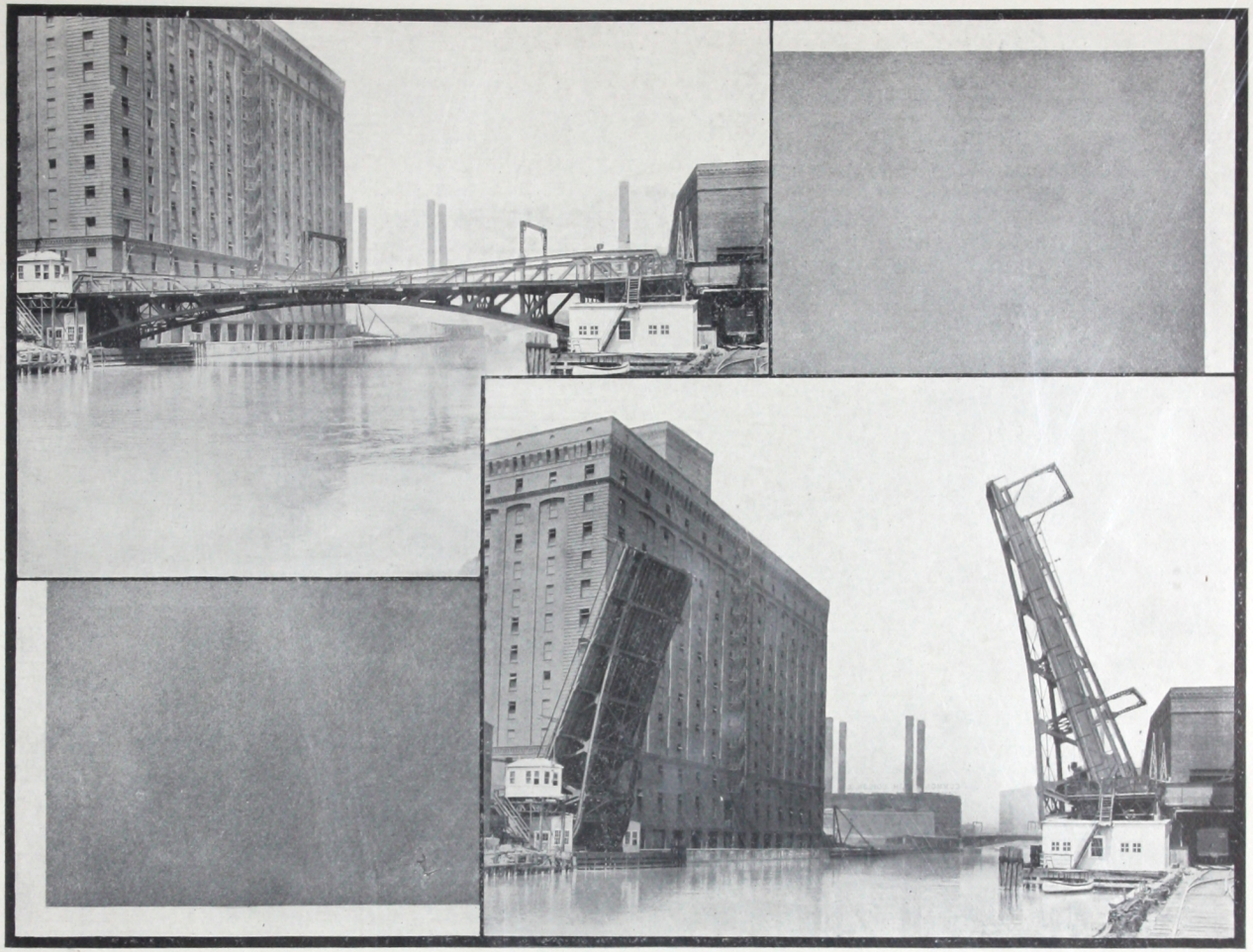
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THE STRAUSS BASCULE BRIDGE CO.
CHICAGO

Completed 1909

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Double Leaf—Movable Span, 193. ft.
Underneath Counterweight
Highway and Double Track Electric Railway

***STRAUSS TRUNNION BASCULE BRIDGE***

***Across South Branch, Chicago River at Polk Street for the City of Chicago***

Since the adoption of its own standard, this is the only other bascule built by the City of Chicago

CITY OF CHICAGO

B. J. MULLANEY, Com., of Public Works
JOHN ERICSON, City Engineer
THOS. G. PIHLFELDT, Bridge Engineer
ALEXANDER Von BABO, Struc. Designer

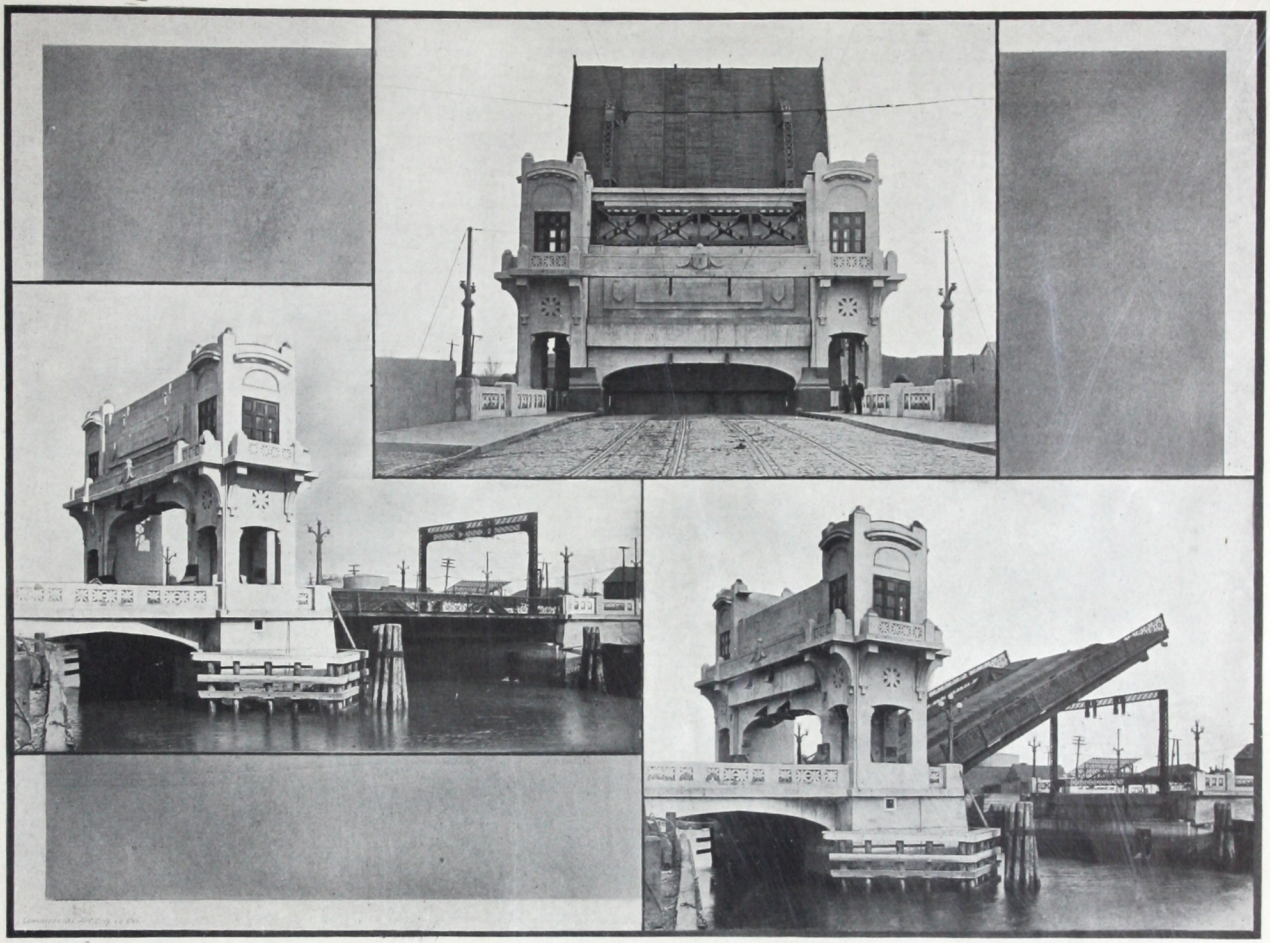
Designed by
THE STRAUSS BASCULE BRIDGE CO.
CHICAGO

Manufactured by the
MODERN STEEL STRUCTURAL CO.
Completed 1910

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Single Leaf—Movable Span, 78 ft. 2 in.
Ornamental—Overhead Counterweight
Highway and Double Track
Electric Railway

***STRAUSS TRUNNION BASCULE BRIDGE***

***Across Cooper Creek, at Federal Street, Camden, N. J.***

***For Camden County, N. J.***

The first and only ornamental Bascule Bridge in America.

CAMDEN COUNTY:
GEO. W. WHYTE, Chairman Bridge Committee
J. J. ALBERTSON, County Engineer

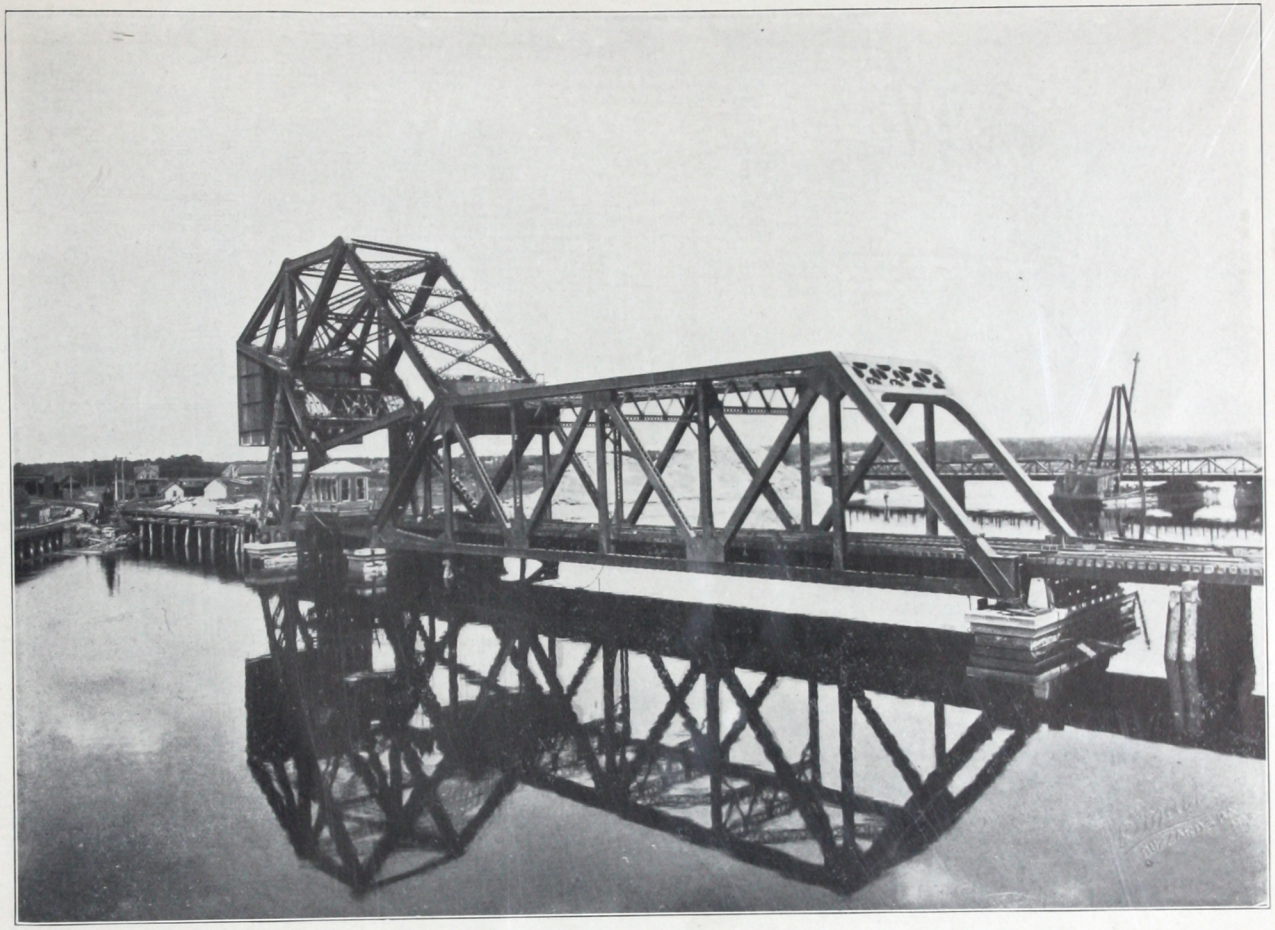
Designed by
THE STRAUSS BASCULE BRIDGE CO.
CHICAGO

Completed 1908

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Single Leaf—Movable Span, 160 ft.
Heel Trunnion Type
Double Track—Live Load E 60

## *STRAUSS TRUNNION BASCULE BRIDGE*

***Across Cape Cod Canal***
***For the Cape Cod Construction Co.***
***Bridge Used and Operated by the N. Y., N. H. & H. R. R.***

First Strauss Heel Trunnion Bridge in service.
Being duplicated for the N. Y. Central Lines at Ashtabula Harbor, Ohio.
12 Bascules of this type in service and under construction.

CAPE COD CONSTRUCTION CO.
WM. BARCLAY PARSONS, Chief Engineer
EUG. KLAPP, Deputy Chief Engineer
N. Y., N. H. & H. R. R.
E. H. McHENRY, Vice-Prest.
EDW. GAGEL, Chief Engineer
W. H. MOORE, Engineer of Bridges.

Designed by
THE STRAUSS BASCULE BRIDGE CO.
CHICAGO

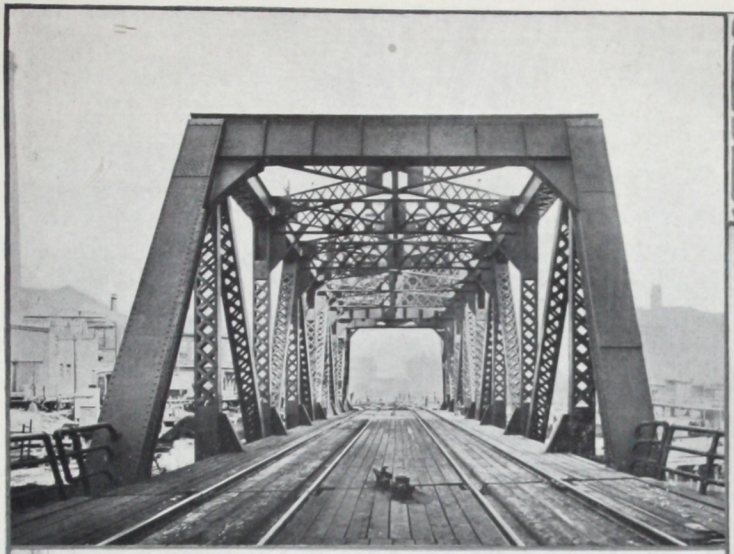
Manufactured and Built by
THE PENNA. STEEL CO.

Completed 1910

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Single Leaf—Movable Span, 170 ft.
Overhead Counterweight
Double Track—Live Load, E-50

***STRAUSS TRUNNION BASCULE BRIDGE***

***Across North Branch of the Chicago River at the Kinzie Street Station, Chicago***

***For the Chicago & North Western Railway Company***

Has averaged 1,100 train movements per day and 1,000 bridge movements per month since completion.

C. & N.-W. Ry. Co.
E. C. CARTER, Chief Engineer
W. H. FINLEY, Ass't Chief Engineer
I. F. STERN, Bridge Engineer

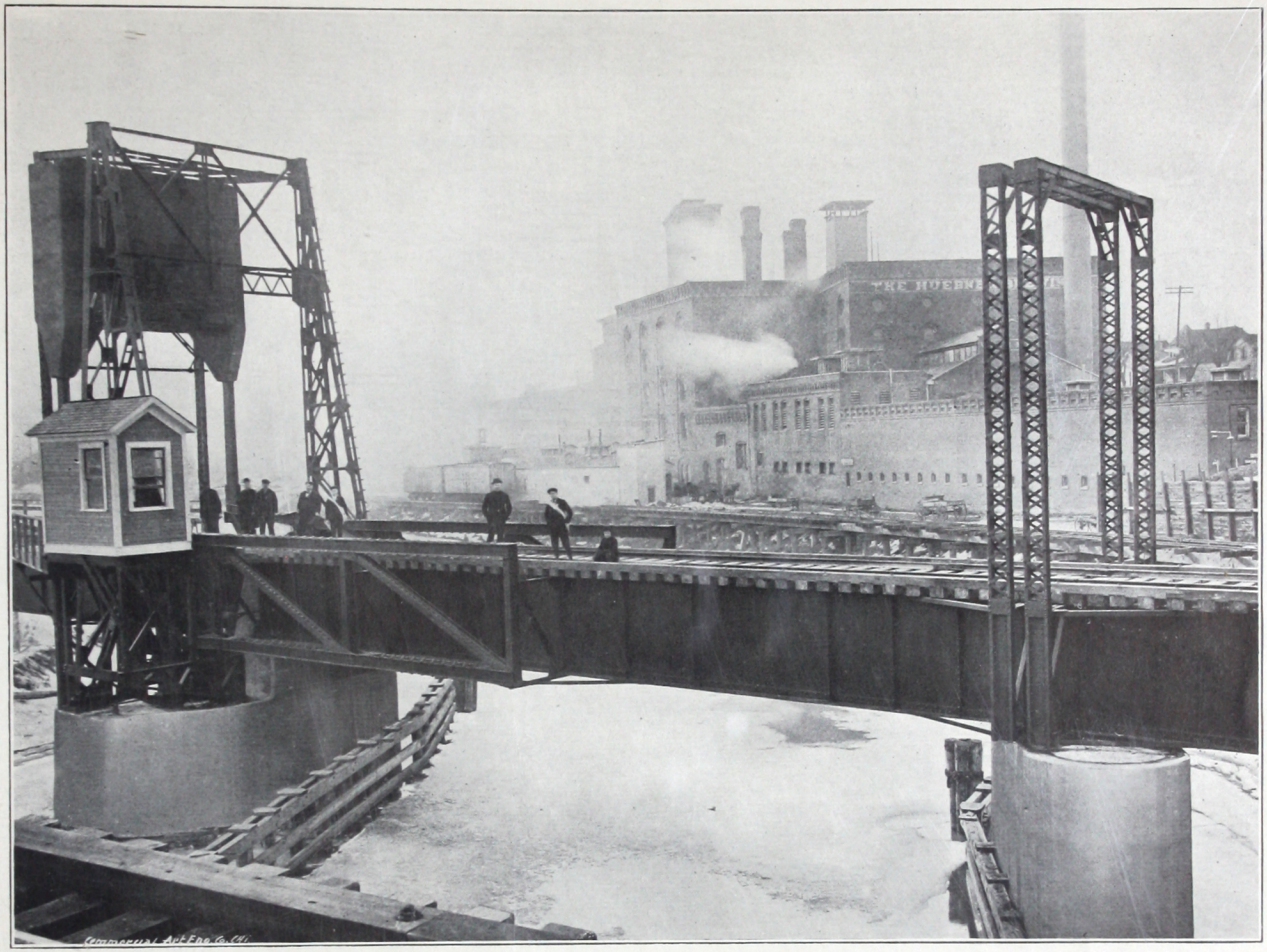
Designed by
THE STRAUSS BASCULE BRIDGE CO.
CHICAGO

Manufactured by
THE TOLEDO-MASSILLON BRIDGE CO.
Completed 1908

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Single Leaf—Movable Span, 73 ft. 6 in.
Overhead Counterweight
Single Track—Live Load 100 Ton Cars

## *STRAUSS TRUNNION BASCULE BRIDGE*

***Across Swan Creek at Toledo, O.***
***For the Ohio Electric Railway Company***

This bridge consists of three 64 ft. deck plate girder spans of indentically the same construction, the middle span being attached to a pair of lifting trusses and thereby counter-balanced and made movable.

OHIO ELECTRIC RAILWAY CO.
GAYLORD THOMPSON, Chief Engineer

Designed by
THE STRAUSS BASCULE BRIDGE CO.
CHICAGO

Manufactured by
THE TOLEDO-MASSILLON BRIDGE CO.
Completed 1909

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# List of Strauss Trunnion Bascule Bridges in Service or Under Construction

September, 1910

## Bridges in Service

***RAILWAY BRIDGES:***

Wheeling & Lake Erie R. R. Co.—Over Cuyahoga River at Cleveland, O., 150′ single leaf, single track.

New Jersey Short Line R. R. Co.—Over Rahway River at East Rahway, N. J., 83′ single leaf, double track.

St. L., I. M. & S. R. R. Co.—Over Black River, 38′ 10″ single leaf, single track.

S. I. R. T. R. R. Co. (B. & O. R. R.).—Over Bodine Creek at Staten Island, N. Y., 50′ 3″ single leaf, double track.

C. & N. W. Ry. Co.—Over Chicago River at Chicago, Ill., 170′ single leaf, double track.

Fla. East Coast Ry.—Over New River at Ft. Lauderdale, Fla., 63′ 6″ single leaf, single track.

Ohio Electric Ry. Co.—Over Swan Creek at Toledo, O., 73′ 6″ single leaf, single track.

Cape Cod Construction Co., (for N. Y., N. H. & H. R. R.).—Over Cape Cod Canal at Buzzards Bay, Mass., 160′ single leaf, double track.

***HIGHWAY BRIDGES:***

Hamilton County, O.—Over Miami & Erie Canal at Lockland, 50′ 6″ single leaf.

City of Copenhagen, Denmark.—Knippels Bridge, 109′ 2″ double leaf.

Camden County, N. J.—Over Cooper's Creek at Federal St., Camden, 78′ single leaf.

Delaware County, Pa.—Over Darby Creek at Lazarette Road, Media, 50′ double leaf.

Union County, N. J.—Over Elizabeth River at First St., Elizabeth, 78′ single leaf.

City of Green Bay, Wis.—Over Fox River at Walnut St., 99′ 9″ single leaf.

City of Chicago, Ill.—Over Chicago River at Polk St., 193′ double leaf.

City of Ottawa, Ill.—Over Illinois River, 118′ single leaf.

## Bridges Under Construction

***RAILWAY AND HIGHWAY BRIDGE (Double Deck):***

Canadian Pacific Ry.—Over Kaministiquia River at Ft. William, Canada, 186′ single leaf; double track railway and 30′ highway.

***RAILWAY BRIDGES:***

National Transcontinental Ry. at Winnipeg, Man.—Over Red River, 129′ 6″ single leaf, double track.

Peoria & Pekin Union Ry. at Peoria, Ill.—Over Illinois River, 160′ single leaf, double track.

Erie R. R. Co. (New York Div.)—Over Hackensack River, 152′ single leaf, double track.

Erie R. R. Co. (New York Division).—Duplicate of above.

Erie R. R. Co. (N. Y. S. & W. R. R.).—Over Overpeck Creek at Little Ferry, N. J., 55′ 5″ single leaf, double track.

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C. & W. I. R. R. Co.—Over Calumet River at Chicago, Ill., 186′ single leaf, double track.

Canadian Northern Ry. Co.—Over Assiniboine River at Winnipeg, Man., 93′ single leaf, double track.

Niagara, St. Catherines & Toronto Ry. Co.—Over Welland Canal Feeder, 55′ 6″ single leaf, single track.

Northern Pacific Ry. Co.—Over Duwamish River at Seattle, Wash., 160′ single leaf, single track.

Grand Trunk Pacific Ry. Co.—Over Ky-Ax River, 55′ single leaf, single track.

N. Y., N. H. & H. R. R. Co.—Over North River at Marshfield, Mass., 35′ single leaf, single track.

Boston & Maine R. R.—Over Squam River near Gloucester, Mass., 50′ 6″ single leaf, double track.

Erie R. R. Co.—Over Cuyahoga River at Cleveland, O., 180′ single leaf, double track.

Dept. of Rys. and Canals of Canada.—Over Trent Canal (Grand Trunk Ry.), 82′ 6″ single leaf, single track.

Dept. of Rys. and Canals of Canada.—(Northumberland Paper Mills), duplicate of above.

Baltimore & Ohio R. R.—At Zanesville, O., 74′ single leaf, double track.

New York Central Lines.—At Ashtabula Harbor, O., 160′ single leaf, double track (duplicate of N. Y., N. H. & H. R. R. Co.'s bridge over Cape Cod Canal at Buzzards Bay).

Harbor Commissioners of Quebec.—Cross Wall Bridge over Entrance to Princess Louise Docks at Quebec, Can., 88′ single leaf, single track.

***HIGHWAY BRIDGES:***

Dept. of Rys. and Canals of Canada.—Over Trent Canal at Wellington St., Lindsay, Ont., 73′ single leaf.

City of St. Petersburg, Russia.—Palace Bridge, over Neva River, 240′ double leaf, 90′ wide.

City of Portland, Oregon.—Over Willamette River, 278′ double leaf, 70′ wide. (Design ordered.)

Dept of Rys. and Canals of Canada.—Over Trent Canal at Campbellford, 108′ single leaf.

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